

Statements of Direction: Computing Architecture

in Washington State Government

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Background

In May 1988, the Information Services Board (ISB) adopted ten goals in a document entitled Strategic Directions for Information Technology (IT) in Washington State Government. In that document, the sixth strategic goal is to migrate to an integrated state computing architecture. A preliminary step toward the implementation of that goal is the development of these statements of direction for computing architecture.

IT offers a significant potential for improving the efficiency and effectiveness of state government. The state of Washington invests tens of millions of dollars each year in IT. Too often these investment decisions are based on one-time costs of development without adequate regard to on-going costs of training, operation and support, and anticipated benefits. A state computing architecture would help to ensure the state achieves maximum benefits from its investment in IT.

The benefits of a computing architecture are:

- ◆ increased opportunities to transfer data between applications and agencies
- ◆ better utilization of scarce technical staff
- ◆ increased opportunity for application transfer or purchase
- ◆ reduced time to implement changes in automation due to consistency in development, maintenance, and support of applications
- ◆ lowered risk that computing environments become obsolete
- ◆ reduced operation cost

Intent

It is the intent of ISB to move prospectively to a structured and standard computing environment. The overall direction of the "open systems architecture" movement is very consistent with ISB goals for computing architecture and may represent an appropriate long-term direction for the state. To be meaningful and effective, computer architecture policies and standards must be periodically reviewed and updated.

The state's computing architecture will encompass an open, multi-tiered combination of host-level computing, workgroup-level computing, and desktop computing. Definitions of the levels of computing are included in Appendix A. It is important to note the definitions of different levels of computing relate to the types of processing performed rather than specific processing equipment.

In order to provide a more structured and standard computing environment, a number of areas must be addressed:

- ◆ Policy and Regulation
- ◆ Hardware and Operating System Software
- ◆ Applications Development
- ◆ Operations
- ◆ Tools
- ◆ Methods

For each area, specific statements of direction follow:

Policy and Regulation

The Department of Information Services, Policy and Regulation Division (DIS/PRD), subject to the oversight and direction of ISB, will establish and maintain standards for computing architecture. DIS/PRD staff will draft policies and standards and will develop an implementation plan for moving to a standard computing architecture over time. The initial focus will be on executive cabinet agencies, although all agencies will be subject to the new policies and standards on a prospective basis.

The resulting policies and standards in conjunction with those for telecommunications and data will address hardware, software, and communications and provide increasing capabilities for end-to-end compatibility of data, text, voice, and image processing in state government. Agencies and the vendor community will be an important part of the standards setting and implementation process.

The ISB expects agencies to develop business-driven plans for the use of IT with active executive-level involvement. The ISB intends to review the IT plans for those agencies spending the most on IT. For those agency plans selected for ISB review, agency directors should present those plans to ISB.

ISB decisions on IT will be linked to the budget process. DIS and the Office of Financial Management will work together to coordinate this review.

Hardware and Operating System Software

Many of the state's current production systems and application development projects reflect a traditional tiered orientation and will continue to do so for some time. As a result, this document seeks to provide direction in terms of these tiers in order to benefit in the near term. At the same time, long-term technology trends are noted and will be considered in developing directions for transitioning from the current, tiered structure to a more open and cooperative architecture. To accomplish this, the focus will be on operating system standards rather than specific hardware.

The first tier of processing in the computing architecture is host-level processing. It is the intent of ISB to move over time to a standard host-level processing environment. Initially, that standard may be a partially open environment with a long-range plan for incorporating an open system architecture at the host level. In addition, it is the intent of ISB that enterprise applications reside on the appropriate processing level or combination of levels to meet state business needs. Enterprise applications are those agency systems that provide operational support to major agency programs.

The middle tier in the computing architecture is workgroup-level processors that are used for intradepartmental applications. Workgroup processors may also be utilized in multi-tiered, enterprise-level applications, either with upload/download capabilities or in interactive combinations with host processors. All workgroup processors will support connectivity and the capacity to share data between applications and between agencies.

Selection of workgroup processors used in multi-tiered enterprise applications, if appropriate for the size and nature of the applications.

The third tier in the computing architecture is desktop processors. These processors will be used in individual or local area network configurations or as part of a multi-tiered, enterprise application. It is the intent of ISB to consider standards for desktop processors used in enterprise applications to ensure consistency and compatibility with other processing levels in this rapidly changing segment of technology.

In order to avoid incompatibilities, to make the best use of available support personnel, and to facilitate rapid implementation, a limited number of computing configurations will be approved by ISB. Statewide standards will be developed for the implementations and use of these configurations.

Agencies, as part of their long-range, planning process, will be expected to transition to the standard computing architecture. The ISB recognizes there may be exceptions to the standard computing architecture. Exceptions will be reviewed by ISB on a case-by-case basis.

Application Development

Application development and maintenance will continue to be the responsibility of agency management. ISB will establish standards and guidelines to provide more structure and consistency to the process.

ISB's intent is for agencies to migrate to preferred applications development, implementation and maintenance methodologies. The ultimate goals are to place automated systems in use in the least amount of time, achieve consistencies in application architecture to speed application development, and to provide opportunities to utilize applications created by other agencies or other governments.

ISB prefers that where possible, applications be purchased or transferred in, rather than custom-built. It is the intent of ISB that agencies, where practical, obtain the rights to alter or change any software purchased to preserve agency abilities to maintain their applications. This typically would not apply to off-the-shelf personal computer applications.

Operations

Shared central services provide a foundation for the efficient statewide use of IT resources. It is the intent of ISB to move to fewer host-level data centers to take better advantage of economies of scale. The establishment of new host data centers will be considered only on an exception basis with a strong burden of proof resting on the agency requesting approval to establish such a center.

It is the intent of ISB that the quality of DIS services be such that it becomes the preferred provider of host-level computing. ISB recognizes that to attract customers, DIS must maintain a consistent track record, perform according to mutually agreed upon service levels, and be cost competitive.

Tools

It is the intent of ISB that choices of software tools be limited. The use of standard tools will lead to consistencies in applications, better training and use of technical personnel, and reduced acquisition and maintenance costs for those tools.

ISB will approve a limited number of file management or database management systems. In addition, ISB will specify preferred report generators, security software, programming languages, and other tools.

Methods

In addition to the current policies on IT planning and feasibility studies, ISB intends to establish policies and methodologies for improving business practices in other IT areas.

Examples of methodologies that will be considered are project management, application development, and quality assurance.

Appendix A

Computing Architecture Definitions:

Desktop Processors:

- ◆ Individual or Workgroup Applications
- ◆ Can be part of multi-tiered applications (performing either client or server functions)
- ◆ Traditional PC applications
 - Spreadsheets, word processing, database emulation, speciality
 - May be stand alone or part of a LAN
- ◆ Workstation applications
 - GIS, CAD, or other engineering
 - Multiprocessing, cooperative processing, image processing

Workgroup Processors

- ◆ Usually driven by application software
- ◆ Specialized application processing
- ◆ Upload/download from host databases or interactive data access/update
- ◆ Can be part of multi-tiered applications (performing server functions)

Host Processors

- ◆ Size of the host is relative to the size of the organization
- ◆ General purpose processor
- ◆ Enterprise application
- ◆ Applications are material in transaction volumes, data volumes, dollars to develop
- ◆ Generally administrative or operational applications

Tools

- ◆ Software designed to make processing or application development more efficient
- ◆ Generally proprietary packages purchased from third parties
- ◆ Includes programming languages, CASE products, operational utilities, DBMSs, spreadsheets, etc.
- ◆ May be specific to hardware or system software

Methods

- ◆ Techniques or methodologies aimed at standardizing approaches to planning, development, maintenance, and operations of systems
- ◆ Generally not specific to hardware or system software
- ◆ May be proprietary products purchased from third parties or internally development